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AUTHOR Fischbach, Robert Mark
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ABSTRACT

The qualities of small group communication and interaction were tested in this study, which specifically measured group consensus and the quality of group decision making. Fifty groups of five members each were used. One member of each group was trained to exhibit either high or low "orientation," knowledge of the procedures the group performed. The groups that contained an individual of "high orientation" were significantly closer to consensus than other groups. However, groups with a "high orientation" individual did not produce significantly higher quality solutions to their sample problems. Also, no decided correlation between high consensus scores and the quality of the group solutions was observed. (CH)

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An Experimental Investigation of the Effects of Orientation on Consensus and the Quality of Group Solutions

by
Robert Mark Fischbach
Illinois State University

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An Experimental Investigation of the Effects of Orientation on Consensus and the Quality of Group Solutions

An Abstract

This study investigated the effects of orientation on consensus and the quality of group solutions. Furthermore, consensus and solution quality were correlated in an attempt to determine whether a positive correlation existed between the two variables. Research has indicated that orientation is positively related to the achievement of consensus in small groups; in addition, it has been suggested that orientation is related positively to the quality of group solutions. Based on the research, the following hypotheses were formulated:

H_1 Groups containing an individual engaging in "high orientation" behavior will be significantly closer to consensus than groups containing an individual engaging in "low orientation" behavior for a question of fact.

H_2 Groups containing an individual engaging in "high orientation" behavior will produce significantly higher quality solutions than groups containing an individual engaging in "low orientation" behavior.

H_3 A high positive correlation will be found between consensus scores and the quality of the group solutions.

Fifty groups comprised of five members each were used in this experiment. Each group was comprised of four S's and a confederate trained to exhibit either high or low orientation. Both S's and confederates were students from the basic communication course at Illinois State University. Twenty groups contained confederates trained in exhibiting high orientation while 30 groups contained confederates trained in exhibiting low orientation. All groups performed the "NASA Space Exercise" (Hall, 1971) as part of a class exercise.

Significant differences in consensus were found between high and low orientation groups to support Hypothesis 1. Hypotheses 2 and 3 were not supported.

An Experimental Investigation of the Effects of Orientation on Consensus and the Quality of Group Solutions

Introduction

Communication scholars' assessment of the status of small group research (Bormann, 1970; Gouran, 1970; Mortenson, 1970; Larson, 1971) have consistently agreed that an overabundence of disjointed and unrelated research findings exist in the area of small group communication. Mortenson (1970) has stated that "the disjointed and incoherent tenor of much group research is evident in the very absence of an underlying theoretical framework for the enormous body of literature published year after year (p. 304). Gouran (1970) has attributed the lack of theory building in small group research to three problems pertaining to the manner in which much research has been conducted. First, the rationale for doing a study is often poorly conceived and even more poorly explicated. Second, a need exists for researchers to ask meaningful questions initially and then to select the most appropriate strategies for answering them. Finally, Gouran stated the need for agreement among small group researchers with respect to establishing priorities of variables most in need of study.

In an attempt to provide some direction for communication scholars, Gouran (1971) asserted that the decision-making process be restored as the first priority of investigation in small group research. He suggested that researchers focus their investigations on four outcomes related to the group decision-making process. Those being: (1) Consensus; (2) quality of decisions; (3) effects of group decision-making on group cohesiveness; and (4) group members' satisfaction with group decisions. With the above criticisms and suggestions in mind, the relationship between orientation, consensus, and the quality of group solutions became the focus of this study.

Review of Literature

Scholars interested in small group research view consensus as one of the most essential elements in group problem-solving. McBurney and Hance (1950), Baird (1937), Phillips (1966), Gulley (1963), Bormann (1969), Barnlund and Haiman (1960), and Keltner (1957) have emphasized the importance of consensus in introductory group discussion textbooks. Although the above authors have indicated the importance of consensus as a goal or outcome in group communication, they present no empirical evidence to support their claims. Little evidence has been provided to validate the assumption that consensual decisions are in fact higher in quality than non-consensual decisions. Should communication researchers fail to validate this assumption, they might begin to reevaluate the importance of consensus as a goal in group communication.

In the past few years, a continuous flow of research has contributed to the variables affecting consensus. Researchers found orientation behavior to be a prominent variable in group interaction and consensus. Carter (1954) found three dimensions of group behavior. One of these dimensions closely corresponded to the definition of orientation employed by Gouran (1969). Gouran operationalized orientation as:

> A statement is said to give orientation if it reflects an attempt on the part of the maker to facilitate the achievement of a group's goal by using facts, making helpful suggestions, or trying to resolve conflict (p. 388).

Gouran attempted to identify variables which distinguished the statements of three consensus groups from the statements of three non-consensus groups in discussions on three questions of policy. Orientation was found to be more related to consensus than any of the other seven variables under investigation.

Gouran's findings provided a firm basis for further research. Knutson (1972) examined the relationship between orientation and consensus. Using confederates, Knutson manipulated orientation behavior in discussions of questions of policy. He found that groups in the "high orientation" condition came closer to consensus than the groups in both the "low" and "no" orientation conditions.

Kline (1972) investigated the total amount of orientation behavior within group discussions by eliminating the confederates from the design. Kline obtained results similar to those found by Knutson. High orientation groups came closer to achieving consensus than low orientation groups.

The Gouran (1969), Knutson (1972), and Kline (1972) investigations have indicated that orientation was related significantly to a group's ability to achieve consensus for questions of policy. At least one study has suggested a positive relationship between orientation behavior and the quality of group solutions. Hall and Watson (1971) investigated whether untrained persons could become effective group members by simply reading a list of discussion rules instead of going through a full training program. The rules closely resembled the criteria established by Gouran (1969) and Knutson (1972) for high orientation behavior. Sixteen groups were given rules while sixteen other groups solved the problem without using the rules. All thirty-two groups performed the NASA Space Problem. The investigators found that uninstructed groups obtained significantly poorer quality solutions than the instructed groups. These findings indicated that rules which closely approximate a high orientation condition favorably influence the quality of the group solution.

SUMMARY

Orientation has been found to affect the ability of a group to achieve consensus on questions of policy. Orientation, however, has not been

investigated in relation to consensus for questions of fact. Research has also suggested that orientation may be related positively to the quality of group solutions. Although orientation has been linked to both consensus and solution quality, the relationship between consensus and solution quality as not been determined. Therefore, the following hypotheses were formulated:

HYPOTHESES

H_1 Groups containing an individual engaging in "high orientation" behavior will be significantly closer to consensus than groups containing an individual engaging in "low orientation" behavior for a question of fact.

H_2 Groups containing an individual engaging in high orientation behavior will produce significantly higher quality solutions than groups containing an individual engaging in "low orientation" behavior.

H_3 A high positive correlation will be found between consensus scores and the quality of the group solutions.

Methodology

This section outlines the logistical and measurement procedures employed in this study to determine more precisely the relationship between orientation, consensus, and solution quality. Furthermore, this section describes the statistical procedures employed in testing the theoretic hypotheses.

Independent Variable

Orientation, the independent variable, refers to a specific behavior by an individual. Two levels of orientation were studied in this experiment: high and low. The levels have been defined operationally as:

High Orientation: An attempt by an individual to resolve conflict, make helpful suggestions, reinforce agreement, and encourage participation.

Low Orientation: An attempt by an individual to intensify conflict, withhold information, insist that no agreement could be reached, and discourage participation.

Dependent Variables

Solution quality and consensus were the dependent variables of this study. Six scales from the Perceived Consensus Test (PCT) (Knutson, et al; 1973) were employed to measure consensus (see Appendix). Each scale was considered a measure of a separate dependent variable. Perceived consensus was defined operationally as:

Perceived Consensus: The degree to which the group members similarly responded to each PCT scale.

Solution quality, the second dependent variable in this study, was defined operationally as:

Solution Quality: The group quality point score obtained on the NASA Test (Hall and Watson, 1971).

Procedure

Two hundred Illinois State University students enrolled in the introductory speech communication course during the Spring semester, 1973, were assigned to fifty groups to perform the "NASA Test" (Hall and Watson, 1971). Fifty different students from the same population were employed as confederates. Each group consisted of four S's and one confederate. The study was conducted in several sections of the basic course as a class exercise. S's were not aware that they had participated in a communication research project. Confederate training tapes were developed and employed to train confederates during special training sessions.

Data Collection

All classroom instructors were given a packet containing all the materials, instructions, consensus measures, and other necessary information prior to the day that the exercise was run in their class. In each class, the instructors formulated groups of five making sure that one confederate was in each group. Groups were allowed 30 minutes to complete the problem.

Following the exercise, each S and the confederate completed the Perceived Consensus Test. S's and confederates also rated each other on orientation. One member in each group completed a sheet on which the final group solution was indicated. Instructors then collected the materials and returned them to the investigator for analysis.

Analysis of Data

Three analyses were performed to test the theoretic hypotheses. The Mann-Whitney U Test was used to analyze the first hypothesis. Analysis of the second hypothesis sought to determine whether a significant difference in the quality of the group solutions existed between high and low orientation groups. A one-way analysis of variance was performed to test the hypothesis.

A Pearson Product Moment correlation was employed to test the third hypothesis. This procedure was utilized to determine whether a high correlation existed between consensus scores and solution quality.

In addition to the analyses required by the hypotheses, Ebel's Intraclass Reliability Procedure (1951) was utilized to determine an estimated reliability of the combined ratings for the S's in each group. In addition, a one-way analysis of variance was employed to determine whether S's had perceived the confederate's orientation differently in the two conditions. The .05 level of confidence was used in reporting all findings.

Results

Hypothesis I

Hypothesis I predicted that high orientation groups would be significantly closer to consensus than low orientation groups. Consensus scores were analyzed by a Mann-Whitney U Test. A U Test was performed for each of the six items on the Perceived Consensus Test. Significant U scores were

obtained for each of the six items that were analyzed (see Appendix, Table 1). The results confirmed the prediction that high orientation groups came significantly closer to consensus than low orientation groups for a question of fact.

Hypothesis II

Hypothesis II stated that high orientation groups would produce significantly higher quality solutions than low orientation groups. A one-way analysis of variance was employed to test this hypothesis (see Appendix, Table 2). The difference between the mean of the high orientation group scores ($\bar{X}$= 29.15) and those of low orientation group scores ($\bar{X}$= 31.80) yielded a nonsignificant + value (+= 1.58, $p > .05$). The hypothesis was not confirmed.

Hypothesis III

The third hypothesis predicted a high positive correlation between consensus scores and solution quality. A Pearson Product Moment correlation was employed to test this hypothesis. Contrary to the prediction, no significant correlation was found between consensus and solution quality (see Table 3).

TABLE 3

CORRELATIONS BETWEEN CONSENSUS AND SOLUTION QUALITY

	Consensus Items					
	1	2	3	4	5	6
Quality	.08	.05	.20	.05	.02	.03

Correlations were not significant above zero.

Results of Manipulation Checks

The confederates' orientation behavior in both the high and low orientation conditions was compared with a one-way analysis of variance (see Appendix, Table 4). The difference between the mean score for confederates in high orientation ($\bar{X}$= 5.46) and the mean score for confederates in low orientation ($\bar{X}$= 2.88) yielded a significant F ratio (F= 103.46, $p < .05$). The results indicated that the confederates had been properly trained to exhibit high and low orientation.

Ebel's Intraclass Reliability (1951) procedures were employed to obtain the estimated combined reliability for the S's ratings in both conditions. A significant combined reliability (r= .492, $p < .05$) was obtained for S's ratings in high orientation. A significant combined reliability (r= .392, $p < .05$) was obtained for S's ratings in low orientation. The results indicated only moderate reliability for S's ratings in both conditions.

Discussion

The value of the present study is found in the questions that were generated rather than answered. Clearly, the study has indicated the need for additional research on orientation behavior, consensus, and the quality of group solutions. Replication of the results found by Knutson (1972) and Kline (1972) has provided additional evidence to support investigators' claims that orientation behavior will significantly influence a group's ability to achieve consensus for questions of fact as well as questions of policy. However, several limitations associated with this investigation provide some possible explanations for the failure to support the second and third hypotheses.

Hypothesis II posited that high orientation groups would reach significantly higher quality solutions than low orientation groups. One

possible explanation for the failure to support this prediction may have been the use of the NASA exercise (Hall and Watson, 1971). NASA was employed in this study because the instrument provided objective criteria to evaluate quality. Furthermore, the exercise could be incorporated into the classroom without making students aware that they were participating in research. However, NASA did not allow for the discovery of a creative solution. Groups of S's rank ordered 15 items in terms of their importance for survival on the moon. The problem required a choice to be made rather than a solution to be developed. Lorge, et al. (1958) has indicated that policy problems were more characteristic of the problems given to groups in real situations. The policy problem allows for creative solutions. The rank order problem, however, is not the type of question over which groups normally deliberate. Lorge, et al. (1958) also reported that the trend of research has been away from the puzzle problems which are less characteristic of life situations.

A second problem of the NASA exercise related to the fact that it was not well adapted to the study's sample. Students have seldom pondered the intracacies of space travel and the implements required for a successful journey. Since NASA neither allowed for creative solutions nor was it well adapted to the sample, the possibility exists that S's perceived the exercise as a nonsalient task for them to perform. Past investigations of consensus have regarded salience as a significant factor and have controlled for it appropriately. Gouran (1969) and Knutson (1972) pretested a number of different discussion topics for the S's. Assuming that S's perceived the exercise as a nonsalient task, the salience research suggests that S's were easily persuaded to agree on any solution in order to complete the task.

In light of these limitations, a questionable assumption remains concerning the quality of the NASA exercise as a means of distinguishing between

the quality of group solutions. Future investigations of solution quality should utilize a more realistic and viable research design which involved solutions to questions of policy. Researchers should employ discussion topics which were pretested and found salient to the experimental S's. Solutions could then be evaluated by professors qualified by training and experience to render opinions of solution quality. The present study also has indicated a need for ongoing research of the dimensions of quality. Researchers might begin investigating individuals whose qualitative evaluations have consistently resulted in superior solutions or decision-making. In other words, future research should begin investigating the dimensions of qualitative evaluations. Descriptive investigations utilizing multivariate analysis might provide the heuristic data necessary for stimulating ongoing research of the dimensions of quality.

A second limitation offering a possible explanation for the failure to support hypothesis II pertained to the manipulation of orientation. Knutson (1972) in an attempt to explain the failure to find differences in consensus between low and no orientation groups, examined the combined orientation behavior of the S's and the confederates (total orientation). He found the confederate's orientation behavior to be significantly different while the total orientation was identical. The same procedure was employed in the present study to explain the failure to find significant difference in the quality of group solutions. A one-way analysis of variance (see Appendix, Table 5) was used to compare the total orientation of the groups in both conditions. The difference between the mean score ($\bar{X}$= 21.26) for high orientation groups and the mean score ($\bar{X}$= 19.11) for low orientation groups yielded a significant F ratio (F= 7.97, p .05). Although the means were significantly different, the investigator questions whether the differences were sufficiently meaningful to produce significant differences in

solution quality. These findings provide strong support for Knutson's suggestion that future research manipulate orientation without a confederate in order to determine the total amount of orientation behavior exhibited in group discussions.

A final limitation with respect to the second hypothesis pertained to the lack of experimental controls provided in the procedural instructions. It must be remembered that the primary reason for conducting the research as a class exercise was to eliminate demand characteristics so often associated with laboratory investigations. Although each instructor received the same information, the instructions allowed for the possibility of small procedural variations within each class. In developing the instructions, the investigator failed to control for grades. Some instructors grade their students on the exercises done in class or on their class participation. Some S's may have assumed that their performance was being graded by the instructor. The possibility exists that these S's viewed the exercise more seriously than S's who assumed their performance was not being evaluated.

Several limitations have been offered to explain the failure to support hypothesis II. Limitations pertaining to control, the manipulation of orientation, and the probable inability of NASA to measure quality may have also produced nonsignificant correlations for quality and consensus scores. A second factor which may have lowered the correlations related to the range of scores obtained from the two measuring instruments was the NASA exercise which resulted in a wide range of quality scores (10 to 71) correlated with the scores from the six PCT scales.- A group score, for each scale, was calculated by summing the four S's responses. The calculation resulted in six consensus scores per group. Consensus scores could range from 4 to 28. However, mean scores and standard deviations for each scale

indicated that scores from both high and low orientation groups fell within a range of 16 and 26 (see Appendix, Table 6). Consensus scores represented a very narrow range. Guilford (1954) indicated that the possibility of obtaining high correlations will decrease if the range of scores decreases as well. Since S's responses to the PCT scales represented a narrow range of scores, the possibility exists that correlations between consensus and quality were lowered.

The present study has indicated the need for additional research on orientation behavior, consensus and the quality of group solutions. Perhaps more descriptive research would provide the greatest pay-off with respect to determining the factors related to qualitative evaluations, solution quality, and consensus.

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APPENDIX

Six Perceived Consensus Test Scales

1. Your group reached moderate agreement on the topic you were discussing

$\overline{CD}$ — — — — — $\overline{CA}$

2. There was a relatively warm, easy-going atmosphere during your discussion

$\overline{CD}$ — — — — — $\overline{CA}$

3. Even if you had continued, your group probably would not have reached agreement on the topic you were discussing

$\overline{CD}$ — — — — — $\overline{CA}$

4. In general, the members in your group discussed the topic in an understandable and orderly manner

$\overline{CD}$ — — — — — $\overline{CA}$

5. Most of the members in your group did not make any helpful suggestions on the topic you were discussing

$\overline{CD}$ — — — — — $\overline{CA}$

6. Some of the participants in your group discussion were more close-minded and opinionated than open-minded and non-opinionated.

$\overline{CD}$ — — — — — $\overline{CA}$

TABLE 1

SUMMARY OF MANN-WHITNEY U TEST RESULTS

Item	z Score
1	2.992*
2	4.556*
3	2.984*
4	5.333*
5	4.929*
6	5.408*

*Indicate a significant difference for consensus.

TABLE 2

SUMMARY OF SOLUTION QUALITY RESULTS

Source of Variance	df	Mean Squares	F
Between Groups	1	106.801	.784[a]
Within Groups	48	136.209	

[a]No significant difference.

TABLE 4

SUMMARY OF RATINGS OF CONFEDERATES' ORIENTATION BEHAVIOR

Source of Variance	df	Mean Squares	F
Between Groups	1	321.367	103.463*
Within Groups	198	3.106	

*Perceived confederate behavior between high and low orientation groups was significantly different.

TABLE 5

SUMMARY OF THE RESULTS FOR TOTAL ORIENTATION

Source of Variance	df	Mean Squares	F
Between Groups	1	55.685	7.97*
Within Groups	48	6.987	

*Total orientation was significantly different for high and low orientation groups ($p < .05$).

TABLE 6

SUMMARY OF MEAN SCORES AND STANDARD DEVIATIONS
FOR GROUP RESPONSES TO THE PERCEIVED CONSENSUS TEST SCORES

Item	High $\bar{X}$	High SD	Low $\bar{X}$	Low SD
1.	24.80	2.20	22.13	4.33
2.	24.00	3.33	19.47	6.26
3.	8.00	3.19	11.43	5.55
4.	25.45	2.44	23.47	9.63
5.	5.40	1.43	8.33	3.32
6.	10.55	4.12	16.87	4.90